



EUROPE<sup>FOR</sup> AVIATION

# Standardisation of Remote Tower

the work of EUROCAE WG-100

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WG-100 chairperson

# ICAO Consideration 1/4

*Establishment of an aerodrome control service does not necessarily imply the immediate provision of a special ATC facility (control tower)*

*...adequately qualified ATC personnel, having means and facilities at their disposal appropriate for the given situation.* (ICAO doc 9426\*)

\*ICAO Doc 9426 (Dez. 1992) - Air Traffic Services Planning Manual  
PART 1 – SECTION 2 – Establishment of Air Traffic Services  
Chapter 1 – Need for Air Traffic Services / Paragraph 1.5.3

## ICAO Consideration 2/4

*The tower must permit the controller to survey those portions of the aerodrome and its vicinity over which he exercises control;*

*The tower must be equipped so as to permit the controller rapid and reliable communications with aircraft with which he is concerned.*

*(ICAO doc 9426\*)*

### **ESSENTIAL OPERATIONAL REQUIREMENT**

\*ICAO Doc 9426 - Air Traffic Services Planning Manual  
PART III – Section 2 – Facilities required by Air Traffic Services  
Chapter 2 - Specific Requirements for an Aerodrome Control Tower / Paragraph 2.1.1

## ICAO Consideration 3/4

*The controller must be able to discriminate between aircraft and between aircraft and vehicles while they are on the same or different runways and/or taxiways.*

(ICAO doc 9426\*)

### **ESSENTIAL OPERATIONAL REQUIREMENT**

\*ICAO Doc 9426 - Air Traffic Services Planning Manual  
PART III – Section 2 – Facilities required by Air Traffic Services  
Chapter 2 - Specific Requirements for an Aerodrome Control Tower / Paragraph 2.1.2

## ICAO Consideration 4/4



### ICAO ATMOPSP/WG/3 Proposal for PANS-ATM, Doc 4444 7.1.1.2.1

*Visual observation shall be achieved through direct out of the window observation or through indirect observation **utilizing a visual surveillance system...***

# EUROCAE WG100

## „Remote and Virtual Tower“



Launch of  
EUROCAE WG-100

2014

**EASA RMG.0624**  
ED Decision 2015/014/R

2015

2016

2017

**EASA NPA**  
**2017-21**

ED Decision 2015/014/R with  
updated GM & AMC to EU  
2015/340

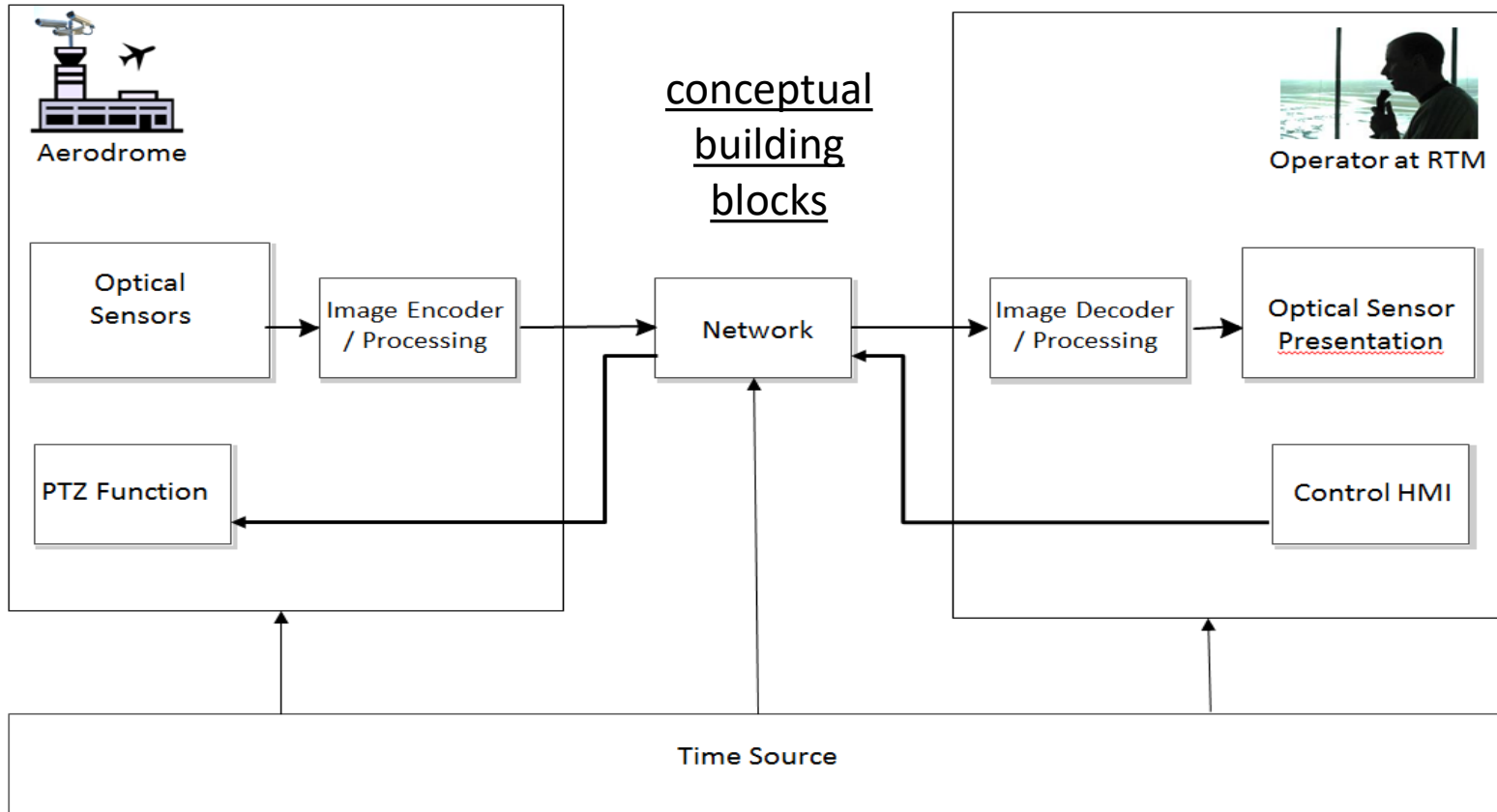
2018

**ICAO Doc4444**  
**amendment**  
**proposal**

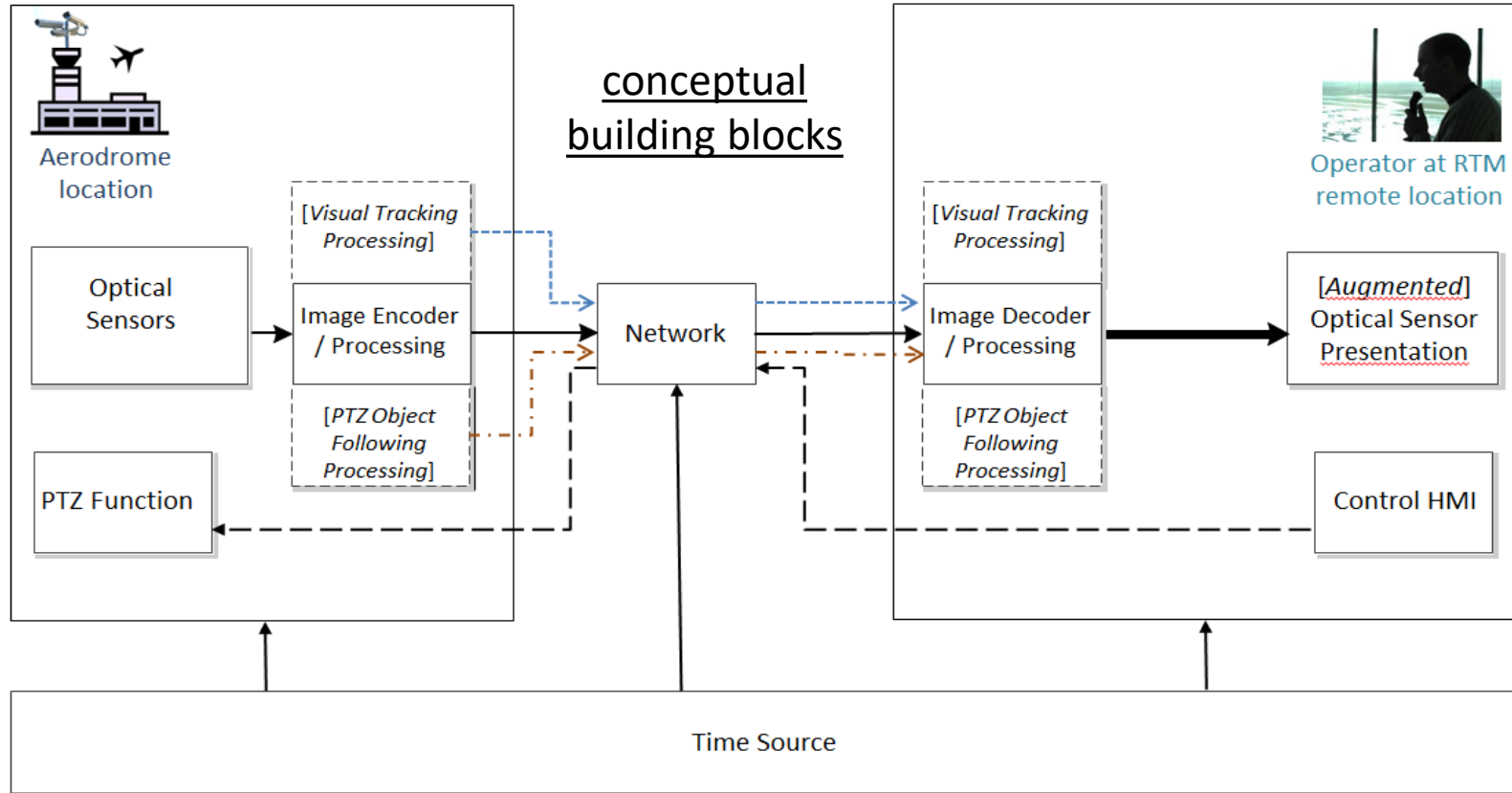
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# EUROCAE ED-240: “Remote Tower Optical System”



# EUROCAE ED-240A: “Remote Tower Optical System”



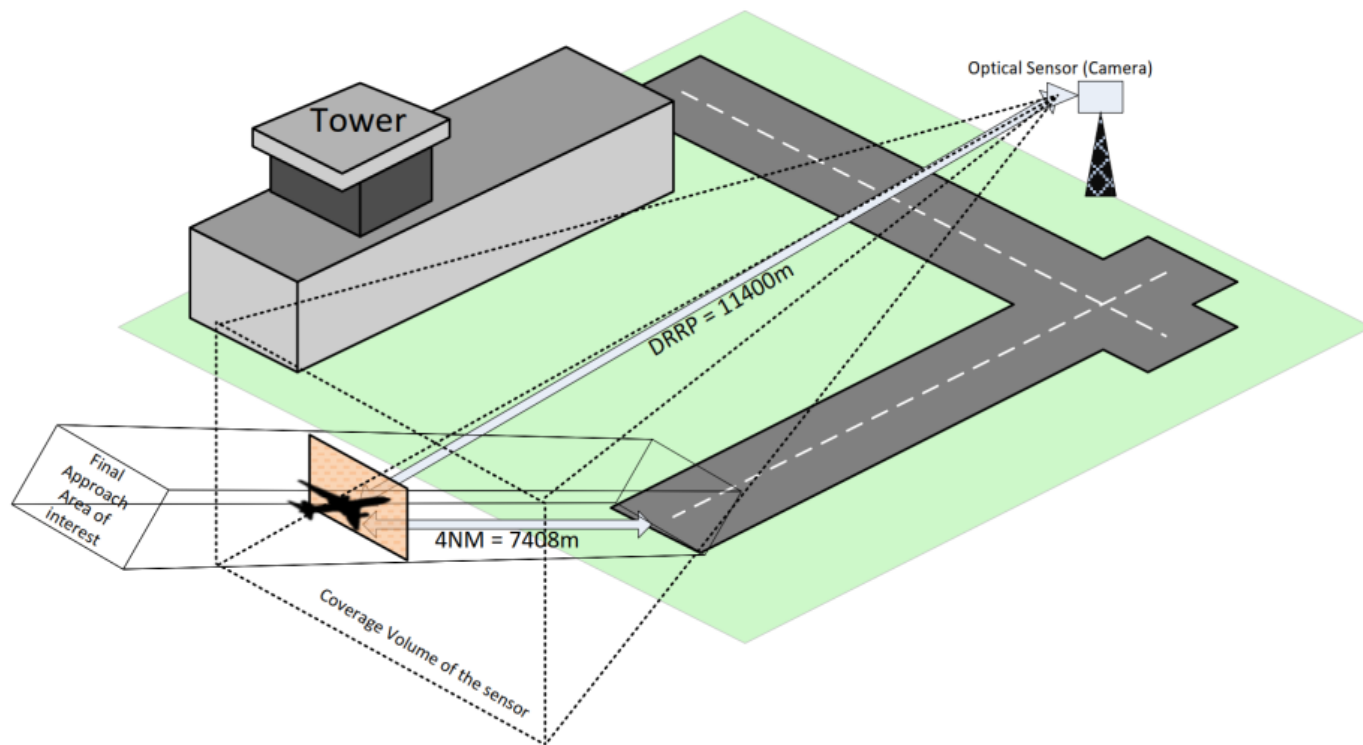


# ED-240A Requirements

Section [REQ]	Name	Value
3.2.1 [REQ 01]	Detection and Recognition Range (DRRP)	Operator Acceptance
3.2.2 [REQ 02]	Latency	$\leq 1$ s
3.2.3 [REQ 03]	Video Update Rate	$> 1$ fps
3.2.3 [REQ 04]	Video Update Rate	Operator Acceptance
3.2.4 [REQ 05]	Video Failure Notification Time	$\leq 2$ s
3.2.5 [REQ 06]	PTZ Function Control Latency	$\leq 250$ ms
3.2.6 [REQ 07]	PTZ Pan Speed	$\geq 60^\circ/\text{s}$
3.2.6 [REQ 08]	PTZ Tilt Speed	$\geq 60^\circ/\text{s}$
3.2.6 [REQ 09]	PTZ Pan Positioning	$\leq 2$ s
3.2.6 [REQ 10]	PTZ Tilt Positioning	$\leq 2$ s
3.2.7 [REQ 11]	Time Synchronisation	$\leq 100$ ms
3.2.8 [REQ 12]	Video Jitter Buffer	N/A
3.2.8 [REQ 13]	Video Jitter Threshold	Operator Acceptance
3.2.9 [REQ 14]	Packet Loss Monitoring	N/A
3.2.9 [REQ 15]	Packet Loss Threshold	Operator specified
3.3.1 [REQ 16]	Visual Tracking Range (VTRP)	Operator Acceptance
3.3.2 [REQ 17]	Number of unwanted Object Indications (NUOI)	Operator specified
3.3.3 [REQ 18]	Object Indication Tracking Update Rate (OITUR)	Operator specified
3.3.4 [REQ 19]	Position Renewal Time-out Period (PRTOP)	Operator specified
3.3.5 [REQ 20]	Object Augmentation Initiation Time (OAIT)	Operator specified
3.4.1 [REQ 21]	Probability of PTZ Object Following Loss (POL)	Operator specified
4.1.1 [REQ 22]	Integrity Monitor Response Time (IMRT)	$\leq 10$ s
4.1.1 [REQ 22]	Mean Time Between Critical Failures (MTBCF)	$\geq 20\,000$ hrs
4.1.1 [REQ 22]	Mean Time Between Failures (MTBF)	$\leq 2$ hrs



# Detection & Recognition Requirements Performance (DRRP)



# Detection & Recognition Range Performance (DRRP)

**TABLE 3: EXAMPLE MATRIX FOR CREATING AERODROME SPECIFIC DRRP**

				Range (m) for Detection (D) and Recognition (R)			
				Panorama		PTZ	
				D	R	D	R
ID	Area of Interest	Targets	Profile Size (m)				
[DRRP REQ 1]	Final Approach	Medium Aircraft	7.0 x 7.0 x 27,2				
[DRRP REQ 2]	Traffic Circuit	Light Aircraft	2.25 x 2.25 x 8.2				
[DRRP REQ 3]	Manoeuvring Area	Persons / Animals	1.8 x 0.5 x 0.5				
[DRRP REQ 4]	Manoeuvring Area	Vehicle	2.5 x 1.5 x 5.0				
[DRRP REQ 5]	Manoeuvring Area	Obstructions	0.3 x 0.3 x 0.3				
[DRRP REQ 6]	Apron	Light aircraft	2.25 x 2.25 x 8.2				
[DRRP REQ 7]	Apron	Obstructions	0.3 x 0.3 x 0.3				
[DRRP REQ 8]	Apron	Vehicle	2.5 x 1.5 x 5.0				
		Persons / Animals	1.8 x 0.5 x 0.5				

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